Perirenal Hematoma in Newborn Infants

V. G. MIKITY, M.D.,
JOAN E. HODGMAN, M.D., and
ALONZO B. CASS, M.D., Los Angeles

THE PRESENCE of a mass in the flank in a newborn baby is usually considered to be a surgical emergency. Despite the fact that tumors in this location in the newborn are rare, many authorities advocate surgical exploration with a minimum of diagnostic studies that would cause delay. However, use of all the indicated diagnostic procedures may reveal a condition for which surgical intervention is not necessary. Three cases of flank mass which were not primarily surgical problems have occurred in the newborn infants at the Los Angeles County Hospital. The mass in each case was perirenal hematoma secondary to unilateral adrenal hemorrhage.

REPORTS OF CASES

CASE 1. The patient, a Caucasian male weighing 8 pounds 10½ ounces was delivered spontaneously following an uncomplicated pregnancy. The mother, 31 years of age, Gravida VII, Para VI, was in good health. The baby, apparently normal, had an Apgar* rating of 10. On routine examination in the nursery 8 hours later the infant was noted to be crying well, and respirations and reflexes were normal. Slight cyanosis was noted around the lips. A 10 x 6 cm. nontender, smooth, firm mass, which moved with respiration and seemed contiguous with the right kidney, was palpated in the right flank. The hemoglobin content at 36 hours of age was 17.5 gm. per 100 cc. Results of urinalysis at this time were within normal limits and blood urea nitrogen was 21 mg. per 100 cc. The infant's general condition in the nursery was good and he accepted routine feedings without difficulty. By the fourth day, the mass seemed to have enlarged, extending to the iliac crest. Hemoglobin content at this time was 18 gm. per 100 cc. An intravenous urogram done on the fifth day of life showed prompt bilateral excretion of radiopaque medium in good concentration, with displacement of the right kidney inferiorly. The renal pelves and calices were normal in contour.

Because retroperitoneal tumor could not be excluded, the infant was taken to surgery on the eighth day of life. At operation, a large collection of blood beneath Gerota's fascia was noted. Palpation of the kidney was difficult and no definite landmarks could be determined. As it was believed that the hemorrhage probably originated from a renal tumor, nephrectomy was done. The excised specimen was a normal fetal kidney surrounded by a large hematoma originating from a grossly hemorrhagic adrenal gland. The microscopic findings were normal fetal kidney and corticomedullary hemorrhage of the adrenal.

At operation the infant received a transfusion of 175 cc. of whole blood. On the first postoperative day the hemoglobin was 14 gm. per 100 cc. and it remained at that level during the subsequent stay in hospital. Results of studies of chemical components of the blood, done on three occasions after operation, were within normal limits. Persistent pyuria developed. A culture of the urine grew an organism of the Klebsiella-Aerobacter group, sensitive to chloramphenicol. Following treatment with this drug, the pyuria cleared and the infant was discharged in good condition at one month of age.

CASE 2. The patient, a Caucasian female, weighing 5,131 grams, was born following a pregnancy that was complicated by mild toxemia in the third trimester. The mother, Gravida IV, Para III, was 33 years of age. Upon apparently normal spontaneous delivery the baby had the umbilical cord around her neck. She did not breath spontaneously and required tracheal catheterization with positive pressure oxygen for 3 or 4 minutes.

Upon examination shortly after birth moderate respiratory distress, acrocyanosis, bruising of the face and a weak cry were noted. A firm 6 cm. kidney-shaped mass which moved with respiration

From the Newborn Service, Los Angeles County Hospital, and the Departments of Radiology and Pediatrics, University of Southern California School of Medicine (Mikity and Hodgman), and the Department of Pediatrics, Loma Linda University, Los Angeles 33 (Cass).

Presented before the Section on Pediatrics at the 90th Annual Session of the California Medical Association, Los Angeles, April 30 to May 3, 1961.

*The Apgar rating is an assessment of the newborn's clinical condition at one minute after birth, based on heart rate, color, muscle tone, respirations, and reflex response, with a range of 0-10. From, "Evaluation of the Newborn Infant—Second Report," Apgar, V., Holaday, D. A., James, L. S., Weisbrot, I. M., and Berrien, C., J.A.M.A., 168:1985-88, Dec. 13, 1958.

was palpated in the left flank. Results of urinalysis were within normal limits and no organisms grew on a culture of the blood. Jaundice appeared during the first 24 hours of life. Results of blood chemical studies 24 hours after birth were: Sugar, 118 mg., urea nitrogen 44 mg., calcium 7.4 mg., phosphorus 15.0 mg., and bilirubin 14.8 per 100 cc., and carbon dioxide 20 mEq. per liter. Anteroposterior and lateral roentgenograms of the abdomen showed a mass in the left upper quadrant. No abnormality was seen in a film of the chest.

The baby's general health remained poor. She had several apneic periods with two generalized convulsions and died at 30 hours of age.

The significant gross autopsy findings were subarachnoid hemorrhage and massive left intra-adrenal hemorrhage with perirenal extension.

CASE 3. The patient, a Caucasian female weighing 5,018 grams, was born following uncomplicated pregnancy. The 41-year-old Gravida XI, Para X mother had been in good health. The weight of her largest previous baby was approximately 10 pounds. There was a family history of diabetes. Delivery was spontaneous, with shoulder dystocia. The baby had an Apgar rating of 8. The amniotic fluid was cloudy with no meconium staining. Acrocyanosis was noted at birth. The baby's cry was good and respirations normal. The right arm was hypotonic and was held in an adducted and internally rotated position with the wrist flexed. The grasp reflex was present.

The infant did well in the nursery until at about 48 hours of age she refused to take her feedings. Four hours later her temperature was 102° F. rectally and she had shallow panting respirations of 100 per minute. A sausage-shaped, nontender mass was palpated in the right flank. In the subsequent 12 hours it increased in size until the upper three-fourths of the right side of the abdomen was filled by a firm, irregular, nontender mass. Hemoglobin content of the blood at this time was 17 gm. per 100 cc. No abnormality was noted on urinalysis, a blood culture grew no organisms and a film of the chest showed a normal heart size and clear lung fields. The infant's general condition improved rapidly and by the third day after birth, 24 hours following the onset of symptoms, respirations and temperature had returned to normal and she had resumed normal feedings. Except for the urea nitrogen content, which was 54 mg. per 100 cc., results of determinations of blood chemical contents were within normal limits.

Further studies were done to determine the nature and location of the mass. Anteroposterior and lateral roentgenograms of the abdomen taken on the third day of life showed a mass in the right abdomen displacing the intestinal gas pattern to the left. A barium enema showed no abnormality. An intravenous urogram showed prompt excretion of opaque medium and good concentration bilaterally. Sufficient opaque medium concentrated in the renal parenchyma to outline the kidneys. The right kidney was somewhat enlarged and irregular in contour, with lateral rotation of the superior pole. The findings were interpreted as showing displacement of the right kidney by a right renal or retroperitoneal tumor. A retrograde urogram done on the fifth day of life showed dye outlining both pelviocalyceal systems with a soft-tissue density surrounding the right kidney. The hemoglobin content on the sixth day of life was 15 gm. per 100 cc. of blood and urea nitrogen content was 42 mg. per 100 cc. On the following day a combined study of an intravenous urogram with simultaneous retroperitoneal and intraperitoneal injection of carbon dioxide clearly revealed a right renal mass encapsulating the kidney (Figure 1). It was concluded that this study had demonstrated a right perirenal hematoma.

Because a retroperitoneal neuroblastoma could not be definitely excluded, the baby was taken to surgery on her seventh day of life. At operation the right retroperitoneal space was observed to be filled with old organized blood clots. The clotted mass was adherent to the renal capsule and when it was removed, fresh hemorrhage occurred. Therefore the kidney and hematoma were excised. The posterior peritoneum in the area was thickened and indurated. The gross specimen and microscopic sections were reported as normal fetal kidney with pericapsular hemorrhage and a hemorrhagic adrenal gland.

The postoperative course was fairly uneventful. The hemoglobin content stabilized at 14 gm. per 100 cc., and the blood urea nitrogen four days after operation was 19 mg. per 100 cc. A fecal-cutaneous fistula developed at the operative site but subsequently healed and the infant was discharged in good condition at four weeks of age. The Erb's palsy was decidedly improved by the time of discharge. On later examination in the pediatric clinic, growth and development of the baby were observed to be normal.

DISCUSSION

The differential diagnosis of a unilateral flank mass in the newborn infant includes consideration of (1) hydronephrosis, (2) duplicated or horseshoe kidney, (3) Wilms' tumor, (4) multicystic kidney, (5) renal vein thrombosis, (6) hamartoma of the kidney, and (7) downward displacement of a normal kidney from adrenal hemorrhage or adrenal neuroblastoma.[5] The normal kidney displaced by a mass will show normal function and prompt excretion of opaque medium, as in the two cases in the present report in which intravenous urography was done.

Differentiation of adrenal hemorrhage from adrenal tumor may be more difficult. The differentiation is important since prompt surgical removal of the primary neuroblastoma in young infants is associated with a fairly good prognosis; in perirenal hematoma the kidney may be normal. Several factors should aid in the diagnosis. Neuroblastoma at birth is rare. Twenty-six cases had been reported in the world literature up to 1951.[3] In ten years' ex-

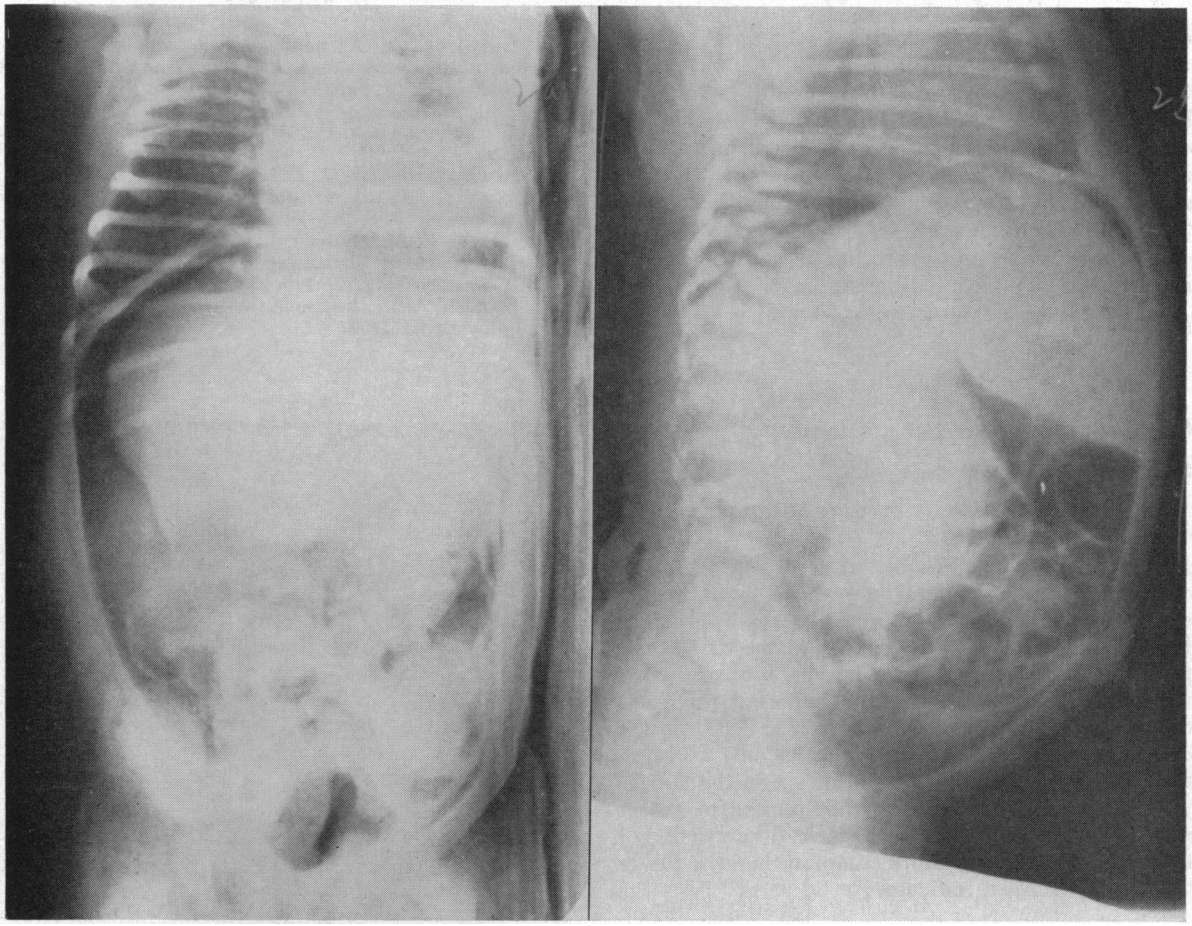

Figure 1 (Case 3).—Anteroposterior and lateral radiographs of the abdomen with pneumo and retroperitoneal insufflation of carbon dioxide show the right kidney encapsulated within the hematoma. The left kidney can be seen in normal position.

perience at the Los Angeles County Hospital covering 100,000 newborn admissions, no cases of neuroblastoma were encountered in the nursery. In the reported cases of congenital neuroblastoma the primary symptom was enlargement of the liver from metastasis, and a mass in the flank was a secondary finding.

The frequency of adrenal hemorrhage in the newborn is well documented in the literature.[1,2,4] A history of trauma during delivery, especially in a large infant, is commonly present, as it was in two of the three cases here presented. Asphyxia at birth, coagulation defect due to hypoprothrombinemia, and the large size and vascularity of the adrenal gland at birth may be contributing factors. The clinical findings associated with adrenal hemorrhage may be grouped in three categories. (1) The patient may have gastrointestinal disturbances and signs of acute adrenal insufficiency such as rapid respiration, pyrexia, skin rash, convulsions and cyanosis. (2) Signs of acute hemorrhage such as shock, collapse, weak pulse, cold extremities, air hunger and decreasing hemoglobin may be present. Also there may be signs of intraperitoneal hemorrhage. (3) Unilateral or bilateral masses in the flanks may appear following delivery. Symptoms from all three categories may be present in greater or lesser degree in any case. In one case herein reported (Case 3) the suggestive symptoms, transient anorexia, fever and tachypnea, were overlooked. Such symptoms appearing in an infant with a mass in the flank support a diagnosis of adrenal hemorrhage as the cause.

When a displaced otherwise normal kidney is demonstrated by intravenous urography, immediate intraperitoneal and retroperitoneal injection of carbon dioxide and appropriate roentgen studies, which can be done readily with little trauma, will show the encapsulating hematoma surrounding the kidney.

It is suggested that a newborn infant with a mass in the flank palpated in the nursery be dealt with as follows:

1. Treatment for adrenal insufficiency—and for blood loss and shock if signs are present—should be carried out.

2. Coagulation defect should be corrected by the administration of 1 to 2 mg. of vitamin K_1 oxide, if it was not given at birth.

3. Radiological examination should include an intravenous urogram; and if it shows an intact but displaced normally functioning kidney, appropriate air study should be done to see if the kidney is surrounded by a mass, making perirenal hematoma the most likely diagnosis.

4. Most important, operation is indicated only if there is uncontrollable hemorrhage.

Los Angeles County General Hospital, 1200 North State Street, Los Angeles 33 (Mikity).

REFERENCES

1. Goldzieher, M. A., and Greenward, H. M.: The hemorrhage of the super-renals in the newborn infant, Arch. Dis. of Child., 36:2, Aug. 1928.

2. Hill, E. E., and Williams, J. A.: Massive adrenal hemorrhage in the newborn, Arch. Dis. of Child., 34:178-182, April 1959.

3. Kouyoumdjian, A. O., and McDonald, J. J.: Association of congenital adrenal neuroblastoma with multiple anomalies, Cancer, 4:784-8, July 1951.

4. Martin, H. M., Graham, J. M., and Hickham, C. J. E.: Adrenal hematoma simulating a tumor in the newborn, A.M.A. Arch. of Surg., 71:195, 1955.

5. Schaffer, A. J.: Disease of the Newborn, W. B. Saunders Co., Philadelphia, 1960.

Carcinoma of Cowper's Gland

Report of the Eleventh Case

ECTOR LE DUC, M.D., San Diego

JUDGING only by the number of cases reported, carcinoma of Cowper's gland appears to be extremely rare, only ten cases having been reported since Paquet and Hermann[7] made note of the first example of this disease in 1884. However, four of the ten were reported after Gutierrez[4] reported the sixth case and reviewed the subject in 1937. While the case here reported brings the total to only 11 in almost 80 years, it makes a total of six in the last 23 years. It appears, therefore, that unreported cases or missed diagnosis because of lack of knowledge of this condition may be more common than the literature on the subject indicates.

SYMPTOMS

Perineal pain was the chief cause of complaint in eight patients, while seven had discovered a lump in the area. Five had pain on defecation, two with rather severe constipation. Some degree of urinary disturbance, from mild frequency with decrease in the size and force of the stream to complete retention was noted in all cases. Four had retention requiring the use of a catheter. Three had spontaneous rupture of the perineal mass, with ulceration and discharge.

The youngest patient was nineteen years of age, two were in their early thirties, the remainder in the fifty-to-seventy age group.

Presented before the Section on Urology at the 90th Annual Session of the California Medical Association, Los Angeles, April 30 to May 3, 1961.

TABLE 1.—*Incidence of Various Symptoms in Ten Cases of Carcinoma of Cowper's Gland.*

Pain in perineum	8
Mass in perineum	8*
Pain on defecation	5
Constipation	2
Urinary difficulty	10
Urinary retention	4
Ulceration	3

*Noticed by patient in seven cases.

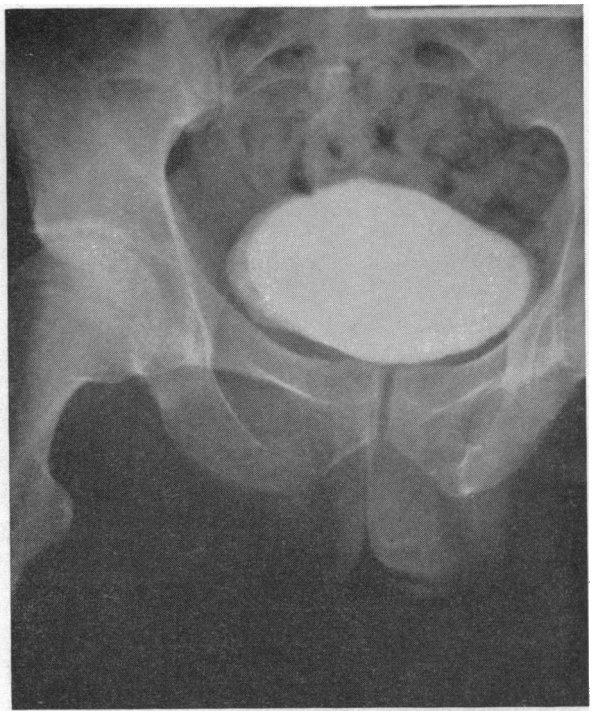

Figure 1.—Cystogram showing no abnormality.

PATHOLOGIC FEATURES

From the microscopic standpoint, the tumor is a cylindroma. It may involve one or both glands, beginning as a hard nodule which gradually enlarges, causing symptoms by compression of the urethra and of the rectum and anus, or by infiltration of the perineal structures. It may ulcerate into the perineum and discharge quantities of bloody mucoid material.[1,9,10] One patient had ulceration postoperatively.[3]

Metastasis was noted in only two cases before the one herein reported. The youngest patient had involvement of the inguinal nodes bilaterally at the original operation, and later abdominal masses developed, with edema of the legs, indicating further involvement of the lymph nodes. In one case[1] bilateral staged node dissection was carried out and six of twelve right, and four of ten left inguinal